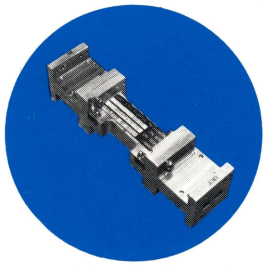
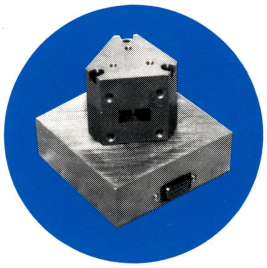
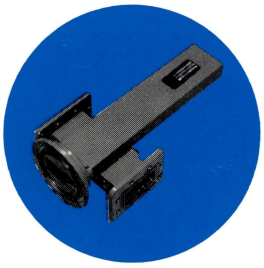
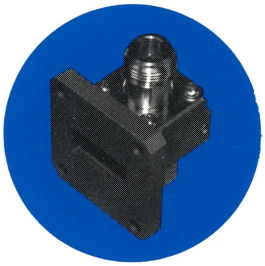
Products Catalog/1990

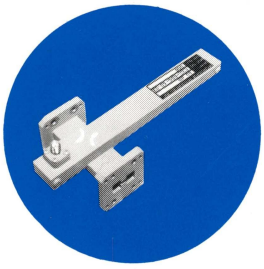
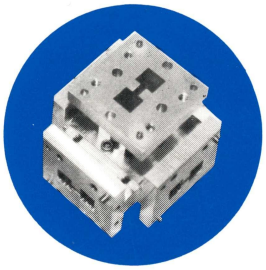



Ferrite Devices

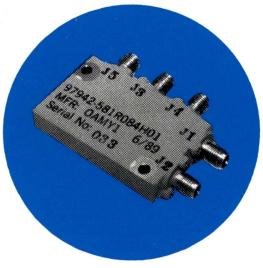




Rectangular Waveguide

Double Ridge Waveguide



Custom Products

Microwave Resources, Inc.

Company Description

Microwave Resources **(MRI)** develops and markets high frequency RF/microwave Control components and Passive components for the Military and Satellite Communications markets. The Company has manufacturing facilities and our direct sales office in the Atlanta suburb of Norcross, Georgia. Support to our Customers is also provided by a network of domestic Manufacturer's Representatives in various locations in the USA.

MRI operates under a MIL-I-45208 Quality System to assure the highest standards for our product base and for custom hardware developed for specific applications. Our Configuration Control System maintains consistency in all our products, unit after unit, so our Customers enjoy a low-cost-of-ownership in goods received.

MRI's Control and Passive components operate under low RF power levels, but are primarily geared for high RF power applications in Transmit Systems, Corporate Feeds and Airborne ECM/EW suites. Our product base is often required in the following systems:

- Tracking Radars.
- Radar Simulators.
- Airborne EW Systems.
- Electronic Counter-Measures (ECM)
- Satellite Transponders.
- Satellite Ground Stations.
- Line-of-Sight Towers.
- Microwave Landing Systems.

MRI's Engineering Staff combines their 48 years experience with proprietary CAE design tools to develop custom hardware for your specific requirements. Our standard product line of Control and Passive components includes the following items:

Control Components:

- Phase Shifters.
- RF Switches.
- Circulators.
- Isolators.
- Modulators: Phase & Amplitude.

Passive Components:

- Directional Couplers.
- Magic Tees & Hybrids.
- Corporate Feed Networks.
- Angle-of-Arrival Networks.
- Filters: Lowpass & Bandpass.

MRI invites our Customer's Engineers, Managers and Procurement personnel to contact our Marketing and Engineering staff to discuss ways we can support your ongoing Projects and work with you on future business opportunities. For superior Control and Passive component technology, turn to Microwave Resources for performance in our hardware and commitment to your contractual obligations.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Facilities

Microwave Resources is located in Norcross, Georgia, a suburb of northeast Atlanta, where manufacturing facilities and our direct sales offices are housed in a modern building of 4,000 square feet. As operations expand, the Company has access to additional floor space adjacent to our existing offices, which MRI's management plans to utilize for production contracts.

MRI operates under a MIL-I-45208 Quality System, with Calibration Standards and Configuration Control geared towards Military contracts, both direct and with Prime Contractors. The Company has established substantial Manufacturing Processes to control the hardware flow of Products, including Inspection Standards and Finishing documents.

The Company performs assembly, alignment and tests on the Products at our Atlanta-area plant. Certain machining and grinding events of piece-parts are performed by nearby fabrication shops in accordance with MRI's drawings and standards.

Assembly personnel are trained and certified to perform Printed Circuit board and wiring harness assembly, certain microwave assembly events, and final finishing steps on the Products to insure consistency and reliability of the end-item.

Alignment and Testing of the Products are performed by personnel trained to operate state-of-the-art electronic and microwave measurement equipment. The Company is tooled from low L-band to millimeter wave frequencies for microwave Products, with various electronic measurement equipment for alignment and test of the power and command functions of the Products, where applicable.

The Company uses outside facilities for certain environmental test requirements, such as: Vibration/Shock, EMI/RFI, and high RF power tests. Thermal tests on the Products are performed at the Company using temperature-controlled chambers and related monitoring sensors.

The Engineering Staff at MRI performs all design tasks to bring the Product into manufacturing, including electrical & microwave circuit design, mechanical & packaging design, and all drawings for piece-parts and top assembly. The Company applies proprietary CAE & CAD design tools during Product development to enhance each performance parameter of the final unit.

MRI develops and markets RF/microwave Control components and Passive components for the Military and Satellite Communication markets. The Company's business includes standard product lines, custom hardware development, and basic engineering research.

Microwave Resources, Inc.
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For more information on new product development, or for technical assistance with your application, please contact the Marketing or Engineering staff at Microwave Resources by telephone or FAX at our Atlanta area office.

Microwave Resources, Inc.

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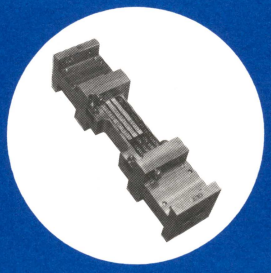
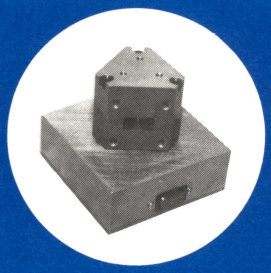
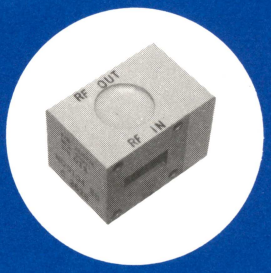
Ferrite Devices







Ferrite Phase Shifters

(Double Ridge Waveguide)

PRODUCT FEATURES:

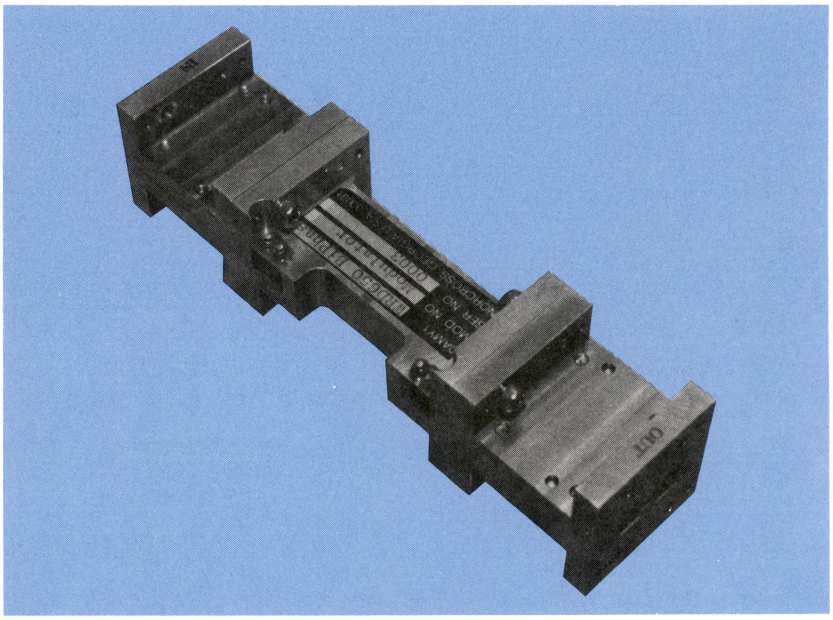
- Flat Phase Shift
- Low Insertion Loss
- Excellent VSWR
- Internal Driver
- Full Bandwidth

SPECIFICATIONS:

- Full Band VSWR: 1.25:1
- Insertion Loss: 0.8 dB
  *Modulation: ± 0.15 dB
- Phase Shift: 360°
  *Flatness: ± 10°
- Phase Increment: See Table
- Switching Time: < 30 usec
- Switching Rate: To 50kHz
- Command Data: Serial
- Trigger Signal: TTL
- Power Supply: + 5 v DC
  ± 28 v DC
- Connector: Type D

Table of Phase Increments

# of Bits	# of Steps	LSB Degree
1	2	180.0
2	4	90.00
3	8	45.00
4	16	22.50
5	32	11.25
6	64	5.625
7	128	2.812
8	256	1.406



Model WDFPxxx: 360° Ferrite Phase Shifter

MRI's product family of Ferrite Phase Shifters are electronically-controlled, multi-bit digital phase shifters that provide 360° of differential phase shift across the octave+ bandwidth of Double Ridge Waveguide. These units maintain constant insertion loss and VSWR levels at each phase setting, which is not dependent on the number of phase steps specified for the unit. They are well-suited for use in beam steering a phased array antenna system.

MODEL NUMBER INFORMATION:

Model Number	Double Ridge Waveguide	Frequency in GHz	Length (Inch)
WDFP200	WRD200D24	2.00-4.80	17.00
WDFP475	WRD475D24	4.75-11.0	13.00
WDFP750	WRD750D24	7.50-18.0	8.00
WDFP650	WRD650D28	6.50-18.0	8.00

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Ferrite Switches

(Rectangular Waveguide)

PRODUCT FEATURES:

- Fast Switching
- High Isolation
- Low Insertion Loss
- Multi-Junction Units
- Rugged Construction

SPECIFICATIONS:

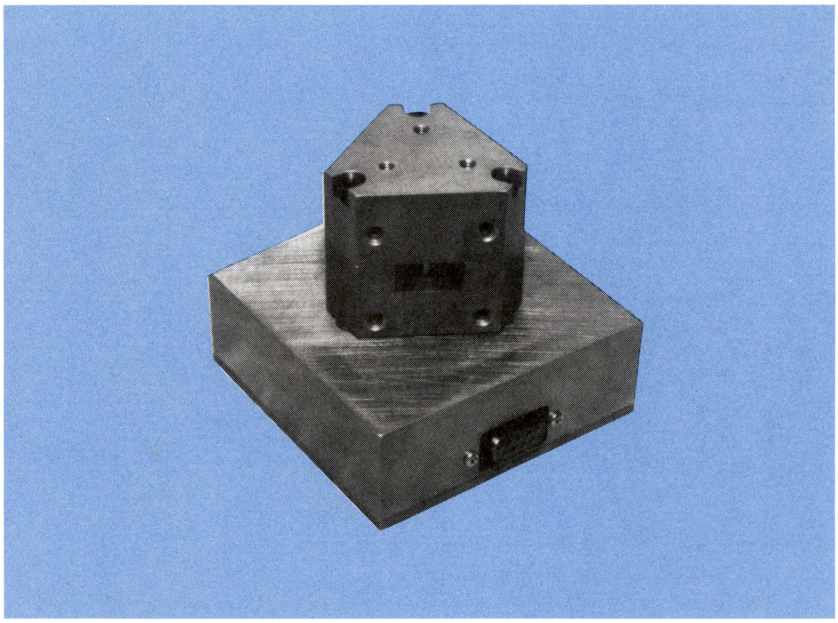
- Bandwidth: 15%
- VSWR: 1.20: 1
- Loss: 0.2 dB
- Isolation: 23 dB
- Switching Time: <30 usec
- Switching Rate: To 50kHz
- Trigger Signal: TTL
- Power Supply: + 5 v DC
  : ± 28 v DC
- Connector: Type D

CONSTRUCTION:

- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- Split Block Housing
- Internal Electronics
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

TECHNICAL ASSISTANCE?

Phone MRI's Engineering Staff at: **404-441-9193** to clarify any questions or FAX your specs to us at: **404-449-8236.**



Model WFSxxx: Ferrite RF Switch

Latching Ferrite Switches in SPDT or in multi-junction configurations are available from MRI for low loss and fast switching in Receive or in Transmit systems. These RF Switches contain integral electronic drivers and can be combined with our Ferrite Isolators to form a complete Switch Matrix.

MODEL NUMBER INFORMATION

Model Number	Waveguide Size	Frequency in GHz	M/3922 Flange
WFS284	WR-284	2.60 - 3.95	52-010
WFS229	WR-229	3.30 - 4.90	52-012
WFS187	WR-187	3.95 - 5.85	57-002M
WFS159	WR-159	4.90 - 7.05	52-016
WFS137	WR-137	5.85 - 8.20	55-002M
WFS112	WR-112	7.05 - 10.0	54-012
WFS90	WR-90	8.20 - 12.4	54-014
WFS75	WR-75	10.0 - 15.0	70-026
WFS62	WR-62	12.4 - 18.0	70-028

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
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Circulators/Isolators

(Rectangular Waveguide)

PRODUCT FEATURES:

- Low Insertion Loss
- High Reverse Isolation
- 25% Bandwidth Units
- Rugged Construction

SPECIFICATIONS:

- VSWR: 1.25: 1
- Loss: 0.4 dB
- Isolation: 20 dB
- Bandwidth: 25%

CONSTRUCTION:

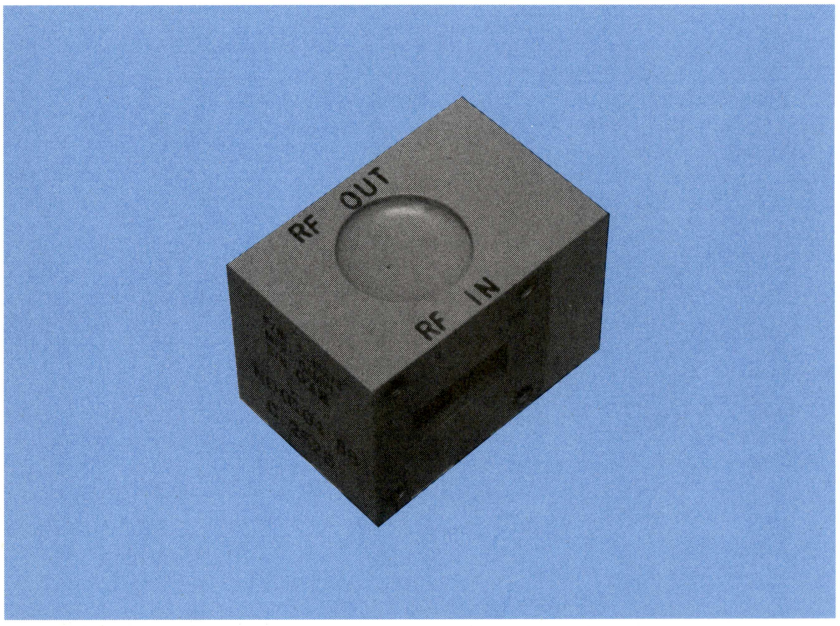
- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- Split-Block Housing
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Choke Flanges
- 002: Better Isolation
- 003: Pressurized Unit
- 004: Finish Selected

SPECIAL FLANGE PATTERN?

Let us know when special flange patterns are used so we can modify ours to interface with yours. We provide full service to our Customers.



Model WFCxxx: Ferrite Circulator
Model WFIxxx: Ferrite Isolator

MRI's product family of Circulators and Isolators are permanent magnet 3-port devices that use a Y-junction Ferrite structure housed in standard Rectangular Waveguide. Isolators have their 3rd port terminated in a matched waveguide load.

MODEL NUMBER INFORMATION

Model Number Circulator	Model Number Isolator	Waveguide Size	Frequency in GHz	M/3922 Flange
WFC284	WFI284	WR-284	2.60 - 3.95	52-010
WFC229	WFI229	WR-229	3.30 - 4.90	52-012
WFC187	WFI187	WR-187	3.95 - 5.85	57-002M
WFC159	WFI159	WR-159	4.90 - 7.05	52-016
WFC137	WFI137	WR-137	5.85 - 8.20	55-002M
WFC112	WFI112	WR-112	7.05 - 10.0	54-012
WFC90	WFI90	WR-90	8.20 - 12.4	54-014
WFC75	WFI75	WR-75	10.0 - 15.0	70-026
WFC62	WFI62	WR-62	12.4 - 18.0	70-028

When ordering, specify **Model Number** from above table.
Data subject to change.

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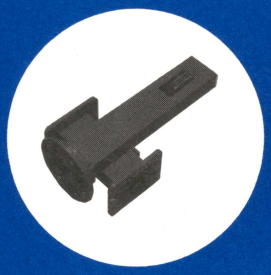
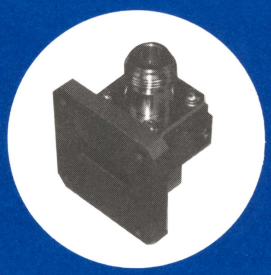
Rectangular Waveguide





High Directivity Topwall Couplers

(Rectangular Waveguide)

PRODUCT FEATURES:

- Flat Coupling
- High Directivity
- S-band thru Ka-band
- Rugged Construction

SPECIFICATIONS:

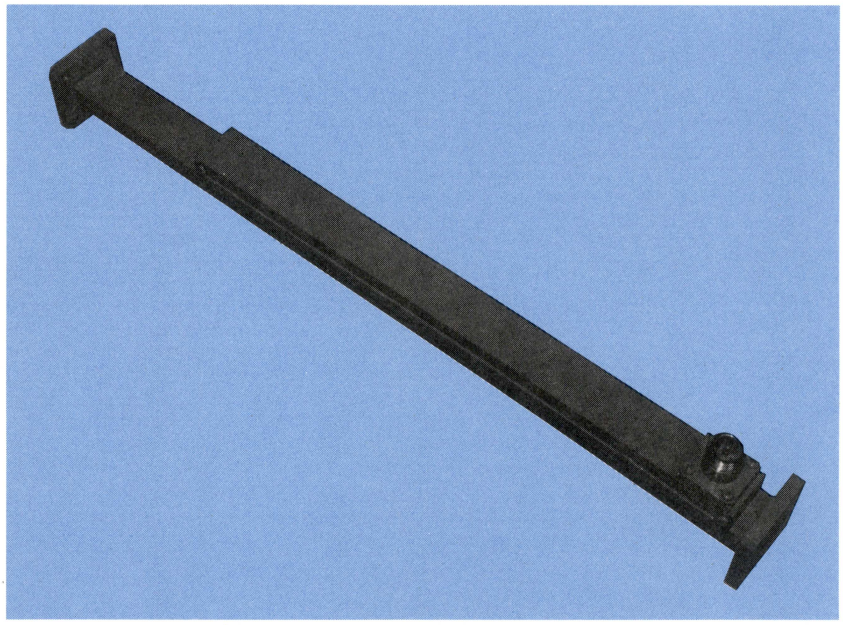
- VSWR: 1.07 Main
  1.20 Coupled
- Coupling: ± 0.4 dB
- Flatness: ± 0.5 dB
- Directivity: 40 dB
- Cover Flanges

CONSTRUCTION:

- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- Dip-Brazed Design
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Choke Flanges
- 002: Copper Waveguide
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Tighter Flatness
- 006: Tapered Coupling
- 007: Half Height W/G



Model WCS-xxx: Single Output Topwall Coupler
Model WCD-xxx: Dual Output Topwall Coupler

MRI's broadwall directional couplers are available in single & dual waveguide configurations. Designed from MRI's proprietary CAE software using superimposed arrays, the units have a very flat coupling profile and high directivity, in excess of 40 dB typ. The coupled channel has a precision load element and an RF output port with a coaxial or with a waveguide interface.

MODEL NUMBER INFORMATION

Waveguide Size	Frequency in GHz	M/3922 Flange	Length of Coupler Single (Inch)	Length of Coupler Dual (Inch)
WR-284	2.60 - 3.95	52-010	48.00	62.00
WR-229	3.30 - 4.90	52-012	36.00	54.00
WR-187	3.95 - 4.90	57-002M	30.00	40.00
WR-159	4.90 - 7.05	52-016	26.00	33.00
WR-137	5.85 - 8.20	55-002M	26.00	32.00
WR-112	7.05 - 10.0	54-012	17.50	25.00
WR-102	7.00 - 11.0	70-014	17.50	25.00
WR-90	8.20 - 12.4	54-014	15.70	22.00
WR-75	10.0 - 15.0	70-026	14.00	20.00
WR-62	12.4 - 18.0	70-020	12.25	16.00
WR-42	18.0 - 26.5	70-028	9.50	14.00

ORDERING INFORMATION

Secondary:
Type (M: male, F: female, WG: waveguide)
Style (S: SMA, N: Type N, T: TNC, A7: APC-7)

Order Model Number: WCS-62-10-NF

Configuration (WCS: Single, WCD: Dual)
Waveguide Size (WR size)
Coupling Value (10, 20, 30, 40 dB)

When ordering, specify **Model Number** from above table.
Data subject to change.

NEED SOMETHING DIFFERENT?

You'll find support at MRI for your custom application by phone: **404-441-9193,** or by FAXing your specs to us at: **404-449-8236**...today.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Cross-Guide Couplers

(Rectangular Waveguide)

PRODUCT FEATURES:

- Flat Coupling
- Good Directivity
- Rugged Construction

SPECIFICATIONS:

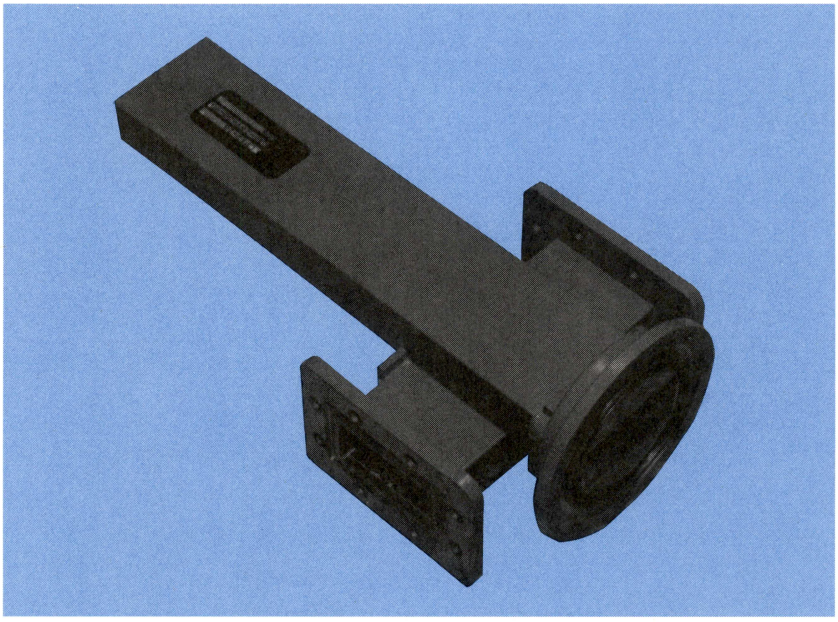
- VSWR: 1.07 (W/G)
  1.20 (Coax)
- Coupling: ± 0.4 dB
- Flatness: ± 1.5 dB
- Directivity: 20 dB
- Cover Flanges

CONSTRUCTION:

- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- Dip-Brazed Design
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Choke Flanges
- 002: Copper Waveguide
- 003: Pressured Unit
- 004: Finish Selected
- 005: Tighter Flatness
- 006: Tapered Coupling



Model WXS-xxx: Single Output Coupler
Model WXD-xxx: Dual Output Coupler

MRI's product family of Cross-Guide Directional Couplers are well suited for power monitoring high peak & CW RF signals in a communication system. These compact couplers are available in both single & dual configurations for sampling forward and/or reverse RF power.

MODEL NUMBER INFORMATION

Waveguide Size	Frequency in GHz	M/3922 Flange	Length (Inch)
WR-284	2.60 - 3.95	52-010	7.50
WR-229	3.30 - 4.90	52-012	6.00
WR-187	3.95 - 5.85	57-002M	5.50
WR-159	4.90 - 7.05	52-016	5.00
WR-137	5.85 - 8.20	55-002M	4.50
WR-112	7.05 - 10.0	54-012	4.00
WR-102	7.00 - 11.0	70-014	3.75
WR-90	8.20 - 12.4	54-014	3.50
WR-75	10.0 - 15.0	70-026	3.00
WR-62	12.4 - 18.0	70-020	3.00
WR-42	18.0 - 26.5	70-028	3.00

ORDERING INFORMATION

Secondary:
Type (M: male, F: female, WG: waveguide)
Style (S: SMA, N: Type N, T: TNC, A7: APC-7)

Order Model Number: WXS-187-40-NF

Configuration (WXS: Single, WXD: Dual)
Waveguide Size (WR size)
Coupling Value (30, 40, 50 dB)

When ordering, specify **Model Number** from above table.
Data subject to change.

PHONE OR FAX YOUR ORDER

Our Marketing staff will assist you when placing an order at **404-441-9193** to insure all parameters are complete for goods & services you need.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Short Loop-Type Couplers

(Rectangular Waveguide)

PRODUCT FEATURES:

- Flat Coupling
- Good Directivity
- Physically Short Units
- High Power Handling

SPECIFICATIONS:

- VSWR: 1.07 Main
  1.20 Coupled
- Coupling: ± 0.5 dB
- Flatness: ± 0.5 dB
- Directivity: 20 dB
- Cover Flanges

CONSTRUCTION:

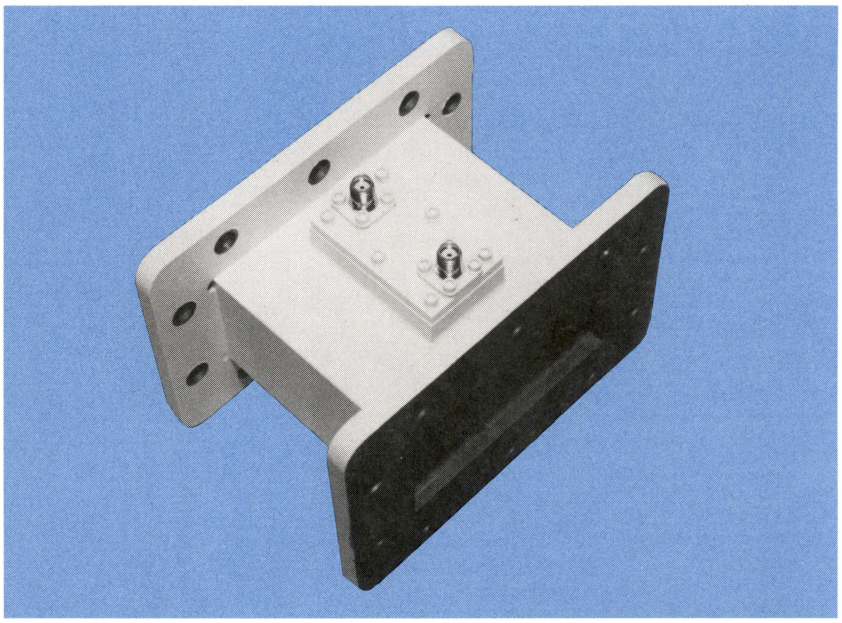
- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- Dip Brazed Design
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Choke Flanges
- 002: Copper Waveguide
- 003: Pressurized Unit
- 004: Finish Selected

TECHNICAL ASSISTANCE?

Phone MRI's Engineering Staff at: **404-441-9193** to clarify any questions or FAX your specs to us at: **404-449-8236.**



Model WLSxxx: Single Output Loop Coupler
Model WLDxxx: Dual Output Loop Coupler

MRI's loop-type couplers in Rectangular Waveguide provide directional sampling of main-line RF power in a physically short length. These units offer flat coupling profiles and good directivity in high peak & CW systems. All units are available in single and dual output configurations.

MODEL NUMBER INFORMATION

Waveguide Size	Frequency in GHz	M/3922 Flange	Length of Coupler Single (Inch)	Length of Coupler Dual (Inch)
WR-284	2.60 - 3.95	52-010	3.00	6.00
WR-229	3.30 - 4.90	52-012	3.00	6.00
WR-187	3.95 - 5.85	57-002M	3.00	6.00
WR-159	4.90 - 7.05	52-016	3.00	6.00
WR-137	5.85 - 8.20	55-002M	3.00	6.00
WR-112	7.05 - 10.0	54-012	2.50	5.00
WR-102	7.00 - 11.0	70-014	2.50	5.00
WR-90	8.20 - 12.4	54-014	2.50	5.00
WR-75	10.0 - 15.0	70-026	2.50	5.00
WR-62	12.4 - 18.0	70-020	2.50	5.00
WR-42	18.0 - 26.5	70-028	2.00	4.00

ORDERING INFORMATION

Secondary:
Type (M: male, F: female)
Style (S: SMA, N: Type N, T: TNC, A7: APC-7)

Order Model Number: WLS-62-50-SF

Configuration (WLS: Single, WLD: Dual)
Waveguide Size (WR size)
Coupling Value (30, 40, 50, 60, 70 dB)

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Coax To Waveguide Adapters

(Rectangular Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- Low Insertion Loss
- Full-Band Coverage
- Rugged Construction

SPECIFICATIONS:

- VSWR: 1.15
- Loss: 0.15 dB
- Cover Flange

CONSTRUCTION:

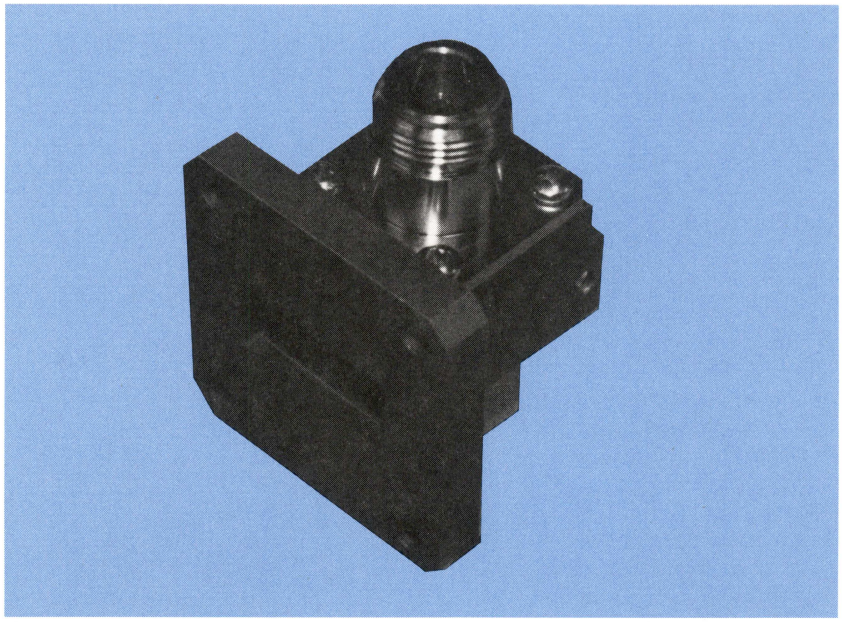
- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- MIL-C-39012 Connectors
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Choke Flanges
- 002: Copper Waveguide
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Better VSWR

NEED SOMETHING DIFFERENT?

You'll find support at MRI for your custom application by phone: **404-441-9193,** or by FAXing your specs to us at: **404-449-8236**...today.



Model CAW: Coax to W/G Adapters

MRI's Coax to Waveguide Adapters are precision low-loss transitions for impedance matching a 50 Ohm coaxial transmission line to a Rectangular Waveguide. These Adapters feature a top-launched probe that converts the Waveguide's TE10 mode to the Coax's TEM mode, across the full operating frequency range, with excellent VSWR.

MODEL NUMBER INFORMATION

Model Number	Frequency in GHz	WR-( ) Size	M/3922 Flange	Length (Inch)
CAW284-	2.60 - 3.95	WR-284	52-010	2.75
CAW229-	3.30 - 4.90	WR-229	52-012	2.50
CAW187-	3.95 - 5.85	WR-187	57-002M	2.50
CAW159-	4.90 - 7.05	WR-159	52-016	2.00
CAW137-	5.85 - 8.20	WR-137	55-002M	2.00
CAW112-	7.05 - 10.0	WR-112	54-012	1.50
CAW90-	8.20 - 12.4	WR-90	54-014	1.30
CAW75-	10.0 - 15.0	WR-75	70-026	1.30
CAW62-	12.4 - 18.0	WR-62	70-020	1.30
CAW42-	18.0 - 26.5	WR-42	70-028	1.40

ORDERING INFORMATION

Coaxial Connector:
Type (M:male, F: female)
Style (S: SMA, N: Type N, T: TNC, A7: APC-7)

Order Model Number: CAW62-NF

Model Number (see table)

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Precision Terminations

(Rectangular Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- Full-band Coverage
- Rugged Construction

SPECIFICATIONS:

- VSWR: 1.02, typ.
- Cover Flange

CONSTRUCTION:

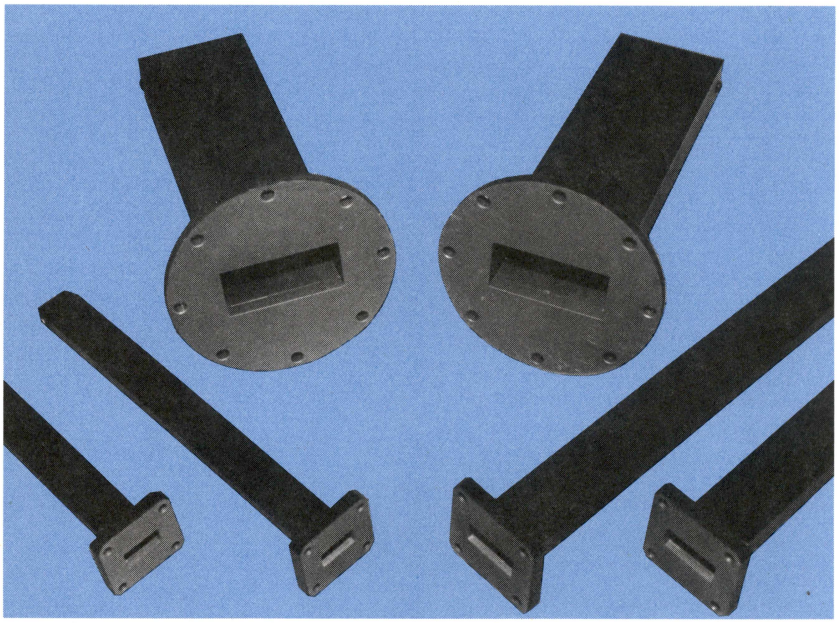
- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Choke Flanges
- 002: Copper Waveguide
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Better VSWR

SPECIAL FLANGE PATTERN?

Let us know when special flange patterns are used so we can modify ours to interface with yours. We provide full service to our Customers.



Model WRLPT: Low Power Terminations

MRI's precision Terminations provide an excellent impedance match for low RF power waveguide systems operating across the full-band frequency range by using a tapered spear load element firmly attached to the housing body.

MODEL NUMBER INFORMATION

Model Number	Frequency in GHz	WR-( ) Size	M/3922 Flange	Power (Max.)	Length (Inch)
WRLPT-340	2.20 - 3.30	WR-340	52-008	12 W	14.00
WRLPT-284	2.60 - 3.95	WR-284	52-010	10 W	12.00
WRLPT-229	3.30 - 4.90	WR-229	52-012	10 W	12.00
WRLPT-187	3.95 - 5.85	WR-187	57-002M	8 W	10.00
WRLPT-159	4.90 - 7.05	WR-159	52-016	7 W	10.00
WRLPT-137	5.85 - 8.20	WR-137	55-002M	6 W	9.00
WRLPT-112	7.05 - 10.0	WR-112	54-012	5 W	9.00
WRLPT-102	7.00 - 11.0	WR-102	70-014	3 W	9.00
WRLPT-90	8.20 - 12.4	WR-90	54-014	4 W	9.00
WRLPT-75	10.0 - 15.0	WR-75	70-026	2 W	8.00
WRLPT-62	12.4 - 18.0	WR-62	70-020	1 W	7.00
WRLPT-42	18.0 - 26.5	WR-42	70-028	0.5 W	7.00

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
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FAX: (404) 449-8236

High Power Terminations

(Rectangular Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- Full-Band Coverage
- RFI Sealed Unit
- Rugged Construction

SPECIFICATIONS:

- VSWR: 1.10
- Cover Flange

CONSTRUCTION:

- MIL-F-3922 Flange
- MIL-W-85 Waveguide
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Choke Flange
- 002: Copper Waveguide
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Better VSWR

PHONE OR FAX YOUR ORDER

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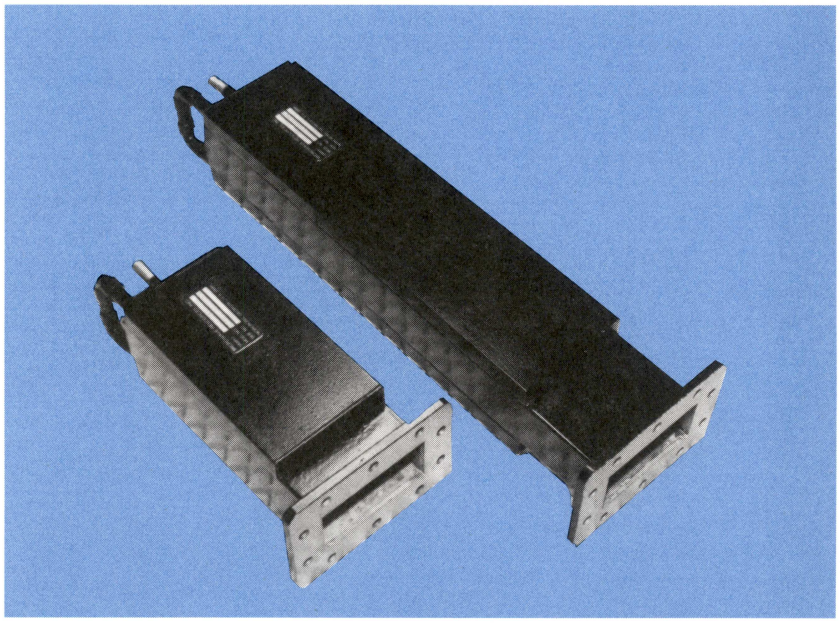


Model WRHPT High Power Terminations

MRI's high RF power Terminations in Rectangular Waveguide use precision ground silicon carbide load elements that are bonded to the internal wall for optimal heat transfer to the air cooled fins. These RFI-sealed units offer extended RF power handling if thermally tied to a cold plate.

MODEL NUMBER INFORMATION

Model Number	Frequency in GHz	WR-( ) Size	M/3922 Flange	Power (Max.)	Length (Inch)
WRHPT-284	2.60 - 3.95	WR-284	52-010	2000 W	18.00
WRHPT-229	3.30 - 4.90	WR-229	52-012	2000 W	18.00
WRHPT-187	3.95 - 5.85	WR-187	57-002M	1500 W	16.00
WRHPT-159	4.90 - 7.05	WR-159	52-016	1200 W	15.00
WRHPT-137	5.85 - 8.20	WR-137	55-002M	1000 W	15.00
WRHPT-112	7.05 - 10.0	WR-112	54-012	1000 W	15.00
WRHPT-102	7.00 - 11.0	WR-102	70-014	750 W	14.00
WRHPT-90	8.20 - 12.4	WR-90	54-014	500 W	9.00
WRHPT-75	10.0 - 15.0	WR-75	70-026	400 W	8.00
WRHPT-62	12.4 - 18.0	WR-62	70-020	350 W	7.00
WRHPT-42	18.0 - 26.5	WR-42	70-028	250 W	6.00

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Waveguide Accessories

(Rectangular Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- Low Insertion Loss
- Full-band Coverage
- Rugged Construction

CONSTRUCTION:

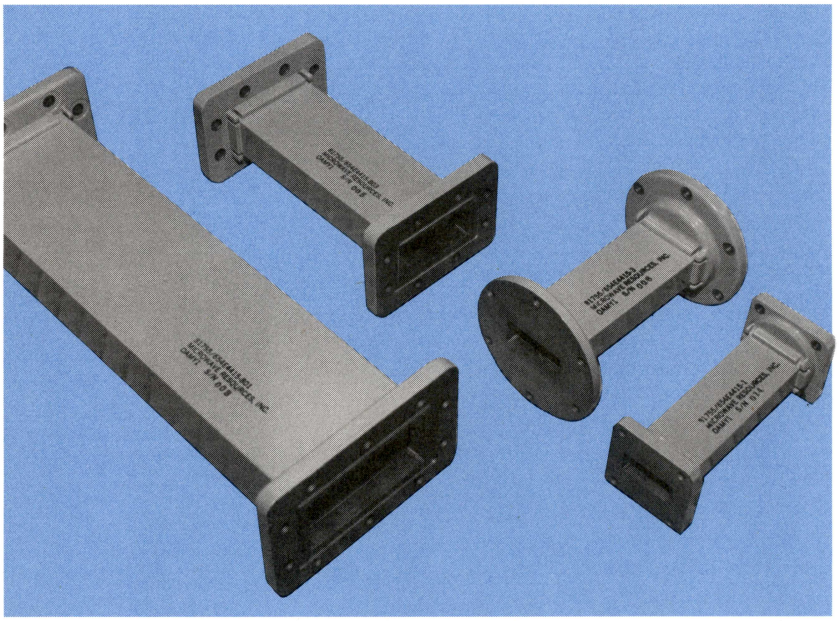
- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- Dip-Brazed Design
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Choke Flanges
- 002: Copper Waveguide
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Half Height Waveguide

TECHNICAL ASSISTANCE?

Phone MRI's Engineering Staff at: **404-441-9193** to clarify any questions or FAX your specs to us at: **404-449-8236.**



Model WRSxxx: Straight Section
Model WRExxx: E-Plane Bend
Model WRHxxx: H-Plane Bend
Model WRTxxx: 90° Twist

Select from MRI's standard product line of Rectangular Waveguide Accessories; from straight sections, bends and twists. Custom products and more complex waveguide assemblies can be supplied to suit your system's size and shape by contacting our Atlanta area office.

MODEL NUMBER INFORMATION

WR-( ) Size	Frequency in GHz	Straight Section	E-Plane Bend	H-Plane Bend	W/G Twist
WR-284	2.06 - 3.95	WRS284	WRE284	WRH284	WRT284
WR-229	3.30 - 4.90	WRS229	WRE229	WRH229	WRT229
WR-187	3.95 - 5.85	WRS187	WRE187	WRH187	WRT187
WR-159	4.90 - 7.05	WRS159	WRE159	WRH159	WRT159
WR-137	5.85 - 8.20	WRS137	WRE137	WRH137	WRT137
WR-112	7.05 - 10.0	WRS112	WRE112	WRH112	WRT112
WR-90	8.20 - 12.4	WRS90	WRE90	WRH90	WRT90
WR-75	10.0 - 15.0	WRS75	WRE75	WRH75	WRT75
WR-62	12.4 - 18.0	WRS62	WRE62	WRH62	WRT62
WR-42	18.0 - 26.5	WRS42	WRE42	WRH42	WRT42
WR-28	26.5 - 40.0	WRS28	WRE28	WRH28	WRT28
WR-22	33.0 - 50.0	WRS22	WRE22	WRH22	WRT22
When ordering, please specify:		Alum. or Copper	Bend Radius; Flange	Bend Radius; Flange	Length and Flange

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
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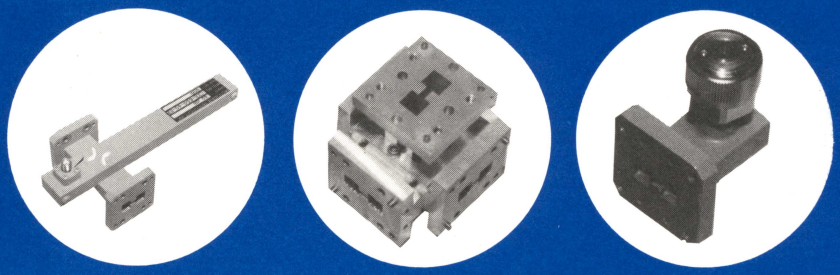
Double Ridge Waveguide



Magic Tees

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Good VSWR
- Low Loss
- 2.4: 1 Bandwidths
- 2.8: 1 Bandwidths
- Rugged Construction

SPECIFICATIONS:

- Full Band VSWR: 1.50: 1
- Insertion Loss: 0.2 dB
- Power Split: 3.01 dB
- Amp. Tracking: 0.15 dB
- Isolation: 35 dB

CONSTRUCTION:

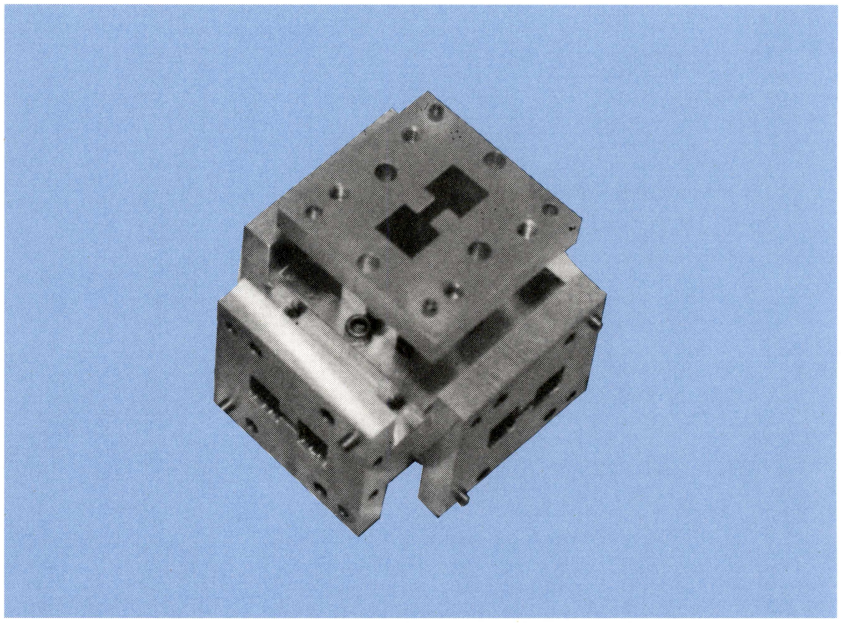
- MIL-F-39000 Flanges
- MIL-W-23351 Waveguide
- Split Block Housing
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Groove Flanges
- 002: Better VSWR
- 003: Pressurized Unit
- 004: Finish Selected

TECHNICAL ASSISTANCE?

Phone MRI's Engineering Staff at: **404-441-9193** to clarify any questions or FAX your specs to us at: **404-449-8236.**



Model WDMTxxx: Double Ridge Magic Tee

MRI's Magic Tees in Double Ridge Waveguide provide equal power split across the full band frequency range with good VSWR and high isolation between the Sum and Delta ports. The units produce in-phase power for Sum port drive, and 180° phase offset for Delta port drive, to the collinear paths.

MODEL NUMBER INFORMATION

Model Number	Double Ridge Waveguide	Frequency in GHz	Size (Inches) L	E	H
WDMT200	WRD200D24	2.00 - 4.80	6.0	3.00	4.2
WDMT475	WRD475D24	4.75 - 11.0	3.0	1.75	1.5
WDMT750	WRD750D24	7.50 - 18.0	2.0	1.25	1.2
WDMT650	WRD650D28	6.50 - 18.0	2.0	1.25	1.2

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Folded E-Plane Magic Tees

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Good VSWR
- Low Loss
- 2.4: 1 Bandwidths
- 2.8: 1 Bandwidths
- Rugged Construction

SPECIFICATIONS:

- Full Band VSWR: 1.35: 1
- Insertion Loss: 0.25 dB
- Power Split: 3.01 dB
- Amp. Tracking: 0.15 dB
- Isolation: 30 dB

CONSTRUCTION:

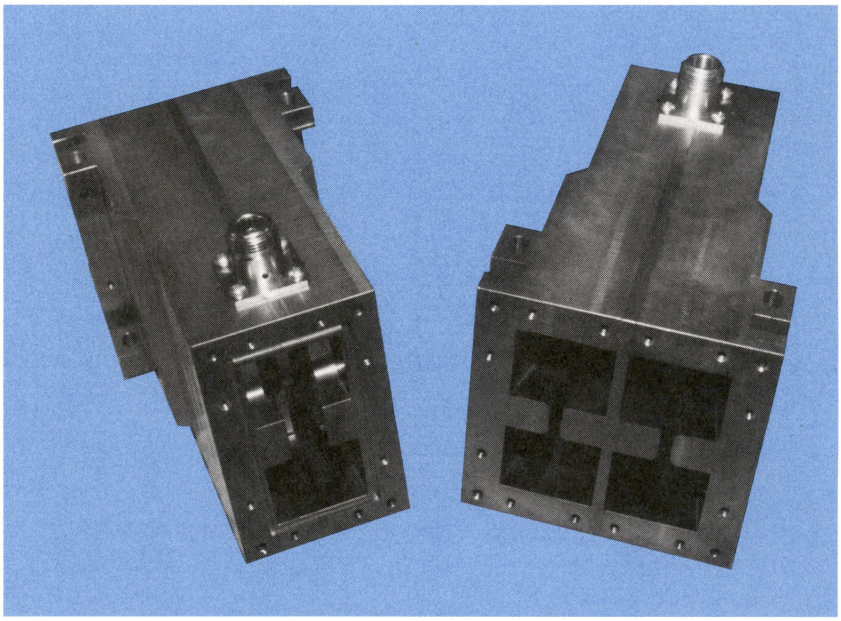
- MIL-F-39000 Flange
- MIL-W-23351 Waveguide
- Split Block Housing
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Groove Flange
- 002: Better VSWR
- 003: Pressurized Unit
- 004: Finish Selected

SPECIAL FLANGE PATTERN?

Let us know when special flange patterns are used so we can modify ours to interface with yours. We provide full service to our Customers.



Model WDETxxx: Folded E-Plane Magic Tee

MRI's Folded E-plane Magic Tees in Double Ridge Waveguide are well suited for low-profile, broadband dividers and power combiners operating at high RF power levels. The units provide equal power split across the octave+ frequency range with good VSWR and high isolation between the waveguide's Sum port and the coaxial Delta port. These units produce in-phase power split for Sum port drive, and 180• phase offset for Delta port drive, to the collinear paths.

MODEL NUMBER INFORMATION

Model Number	Double Ridge Waveguide	Frequency in GHz	Length (Inch)
WDET200	WRD200D24	2.00 - 4.80	6.00
WDET475	WRD475D24	4.75 - 11.0	4.00
WDET750	WRD750D24	7.50 - 18.0	3.00
WDET650	WRD650D28	6.50 - 18.0	2.50

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

High Directivity Topwall Couplers

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Flat Coupling
- High Directivity
- 2.4:1 Bandwidths
- 2.8:1 Bandwidths
- Rugged Construction

SPECIFICATIONS:

- VSWR: 1.07 Main
  1.20 Coax
- Coupling: ± 0.4 dB
- Flatness: ± 1.5 dB
- Directivity: 35 dB
- Cover Flanges

CONSTRUCTION:

- MIL-F-39000 Flanges
- MIL-W-23351 Waveguide
- Dip-Brazed design
- MIL-C-5541/1A iridite
- MRI's epoxy blue paint

STANDARD OPTIONS:

- 001: Groove Flanges
- 002: Shorter length
- 003: Pressurized unit
- 004: Finish selected
- 005: Tighter Flatness
- 006: Tapered Coupling

NEED SOMETHING DIFFERENT?

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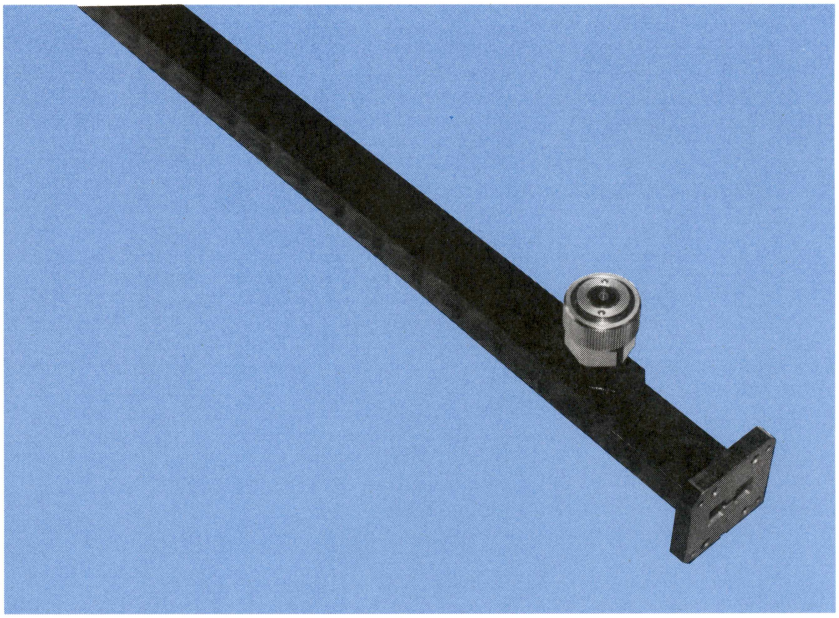


Model WDCS-xxx: Single Output Topwall Coupler
Model WDCD-xxx: Dual Output Topwall Coupler

MRI's Broadwall Directional Couplers are available in single & dual Double Ridge Waveguide configurations. These high directivity Couplers offer flat coupling profiles across the octave+ frequency bandwidth and are available in a variety of mechanical packages.

MODEL NUMBER INFORMATION

Double Ridge Waveguide Size	Frequency in GHz	Length of Coupler Single (Inch)	Length of Coupler Dual (inch)
WRD-200D24	2.00 - 4.80	48.0	54.0
WRD-350D24	3.50 - 8.20	38.0	50.0
WRD-475D24	4.75 - 11.0	32.0	40.0
WRD-650D28	6.50 - 18.0	28.0	31.0
WRD-750D24	7.50 - 18.0	24.0	27.0

ORDERING INFORMATION

Secondary:
Type (M: male, F: female, WG: waveguide)
Style (S: SMA, N: Type N, T: TNC, A7: APC-7)

Order Model Number: WDCS-650-20-NF

Configuration (WDCS: Single, WDCD: Dual)
Waveguide Size (WRD size)
Coupling Value (10, 20, 30, 40, 50 dB)

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Cross-Guide Couplers

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Octave Coverage
- Flat Coupling
- Good Directivity
- Rugged Construction

SPECIFICATIONS:

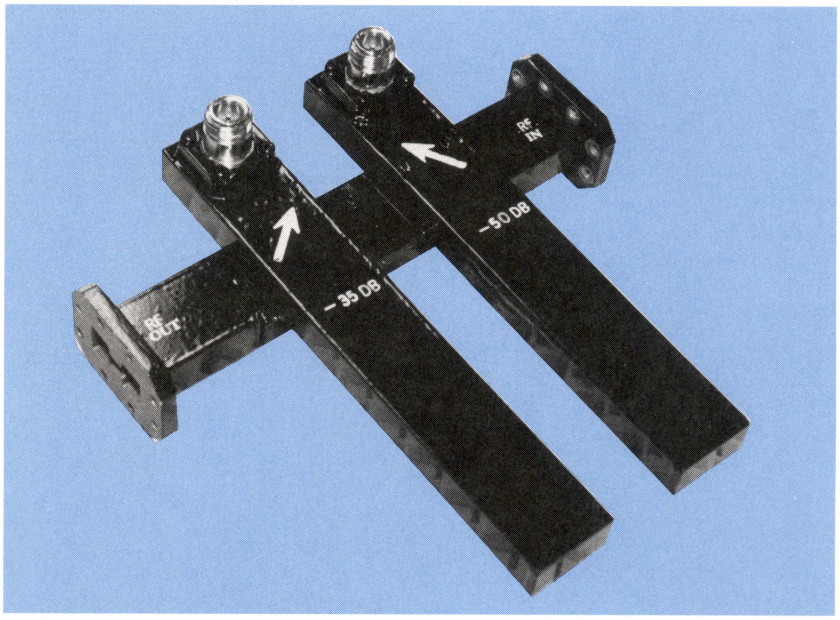
- VSWR: 1.07 Waveguide
  1.20 Coax Ports
- Coupling: ± 0.4 dB
- Flatness: ± 1.0 dB
- Directivity: 20 dB
- Cover Flanges

CONSTRUCTION:

- MIL-F-39000 Flanges
- MIL-W-23351 Waveguide
- Dip-Brazed Design
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

• STANDARD OPTIONS:

- 001: Choke Flanges
- 002: Shorter Length
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Tighter Flatness
- 006: Tapered Coupling



Model WDXS-xxx: Single Output Coupler
Model WDXD-xxx: Dual Output Coupler

MRI's product family of Cross-Guide Directional Couplers constructed in Double Ridge Waveguide perform well as power monitors in high peak & CW RF communication systems. The units are available in both single & dual configurations for sampling forward and/or reverse RF power.

MODEL NUMBER INFORMATION

Double Ridge Waveguide Size	Frequency in GHz	Length (Inch)	Width (Inch) Single	Dual
WRD-200D24	2.00 - 4.80	6.00	12.00	6.00
WRD-350D24	3.50 - 8.20	5.00	8.00	5.00
WRD-475D24	4.75 - 11.0	4.50	7.50	4.50
WRD-650D28	6.50 - 18.0	3.00	6.50	3.00
WRD-750D24	7.50 - 18.0	3.00	6.50	3.00

ORDERING INFORMATION

Secondary:
Type (M: male, F: female, WG: waveguide)
Style (S: SMA, N: Type N, T: TNC, A7: APC-7)

Order Model Number: WDXS-650-40-SF

Configuration (WDXS: Single, WDXD: Dual)
Waveguide Size (WRD size)
Coupling Value (30, 40, 50 dB)

When ordering, specify the octave frequency range and **Model Number.**
Data subject to change.

PHONE OR FAX YOUR ORDER

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Microwave Resources, Inc.
P.O. Box 1109
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FAX: (404) 449-8236

Coax to Waveguide Adapters

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- Low Insertion Loss
- Full-Band Coverage
- Rugged Construction

SPECIFICATIONS:

- VSWR: 1.20
- Loss: 0.15 dB
- Cover Flange

CONSTRUCTION:

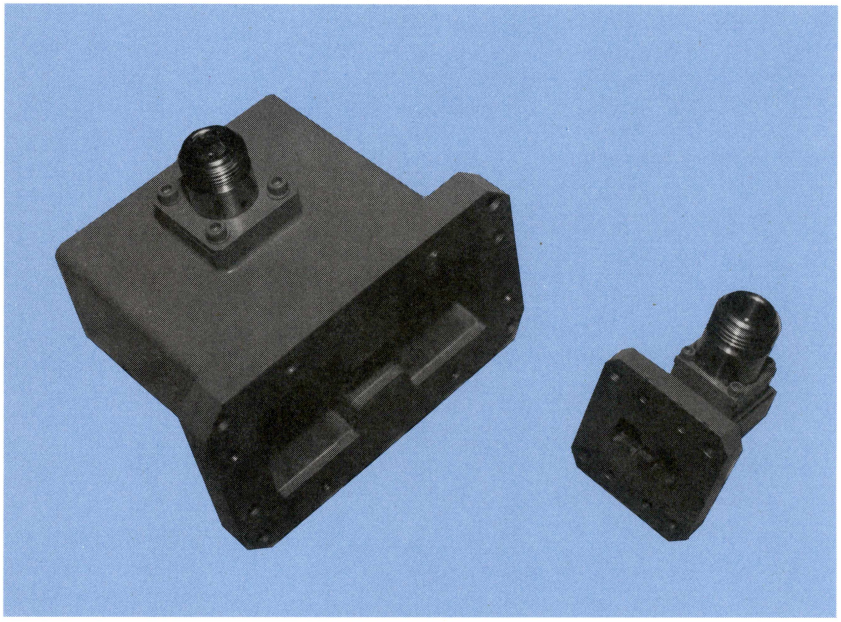
- MIL-F-39000 Flanges
- MIL-C-39012 Connector
- MIL-W-23351 Waveguide
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Groove Flange
- 002: Shorter Length
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Better VSWR

TECHNICAL ASSISTANCE?

Phone MRI's Engineering Staff at: **404-441-9193** to clarify any questions or FAX your specs to us at: **404-449-8236.**



Model CARxxx: Coax to WRD Adapters

MRI's Coax to Double Ridge Waveguide Adapters offer excellent VSWR & low loss for impedance matching a 50 Ohm coaxial transmission line to Double Ridge Waveguide. These Adapters use a precision top-launched probe assembly for converting the WRD's TE10 mode to the Coax's TEM mode, across the full octave+ frequency range.

MODEL NUMBER INFORMATION

Model Number	Frequency in GHz	Double Ridge Waveguide Size	Length (Inch)
CAR200	2.00 - 4.80	WRD-200D24	2.50
CAR350A	3.50 - 8.20	WRD-350D24	2.00
CAR350B	3.50 - 12.4	WRD-350D36	2.00
CAR475	4.75 - 11.0	WRD-475D24	1.75
CAR500	5.00 - 18.0	WRD-500D36	1.75
CAR650	6.50 - 18.0	WRD-650D28	1.50
CAR750	7.50 - 18.0	WRD-750D24	1.50

ORDERING INFORMATION

Coaxial Connector:
Type (M: male, F: female)
Style (S: SMA, N: Type N, T: TNC, A7: APC-7)

Order Model Number: CAR650-NF

Model Number (See table)

When ordering, specify **Model Numbe**r from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Coax to WRD Adapters: End-Launched

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Good VSWR
- Low Loss
- 2.4: 1 Bandwidths
- 2.8: 1 Bandwidths
- Rugged Construction

SPECIFICATIONS:

- Full Band VSWR: 1.35: 1
- Insertion Loss: 0.25 dB
- Cover Flange

CONSTRUCTION:

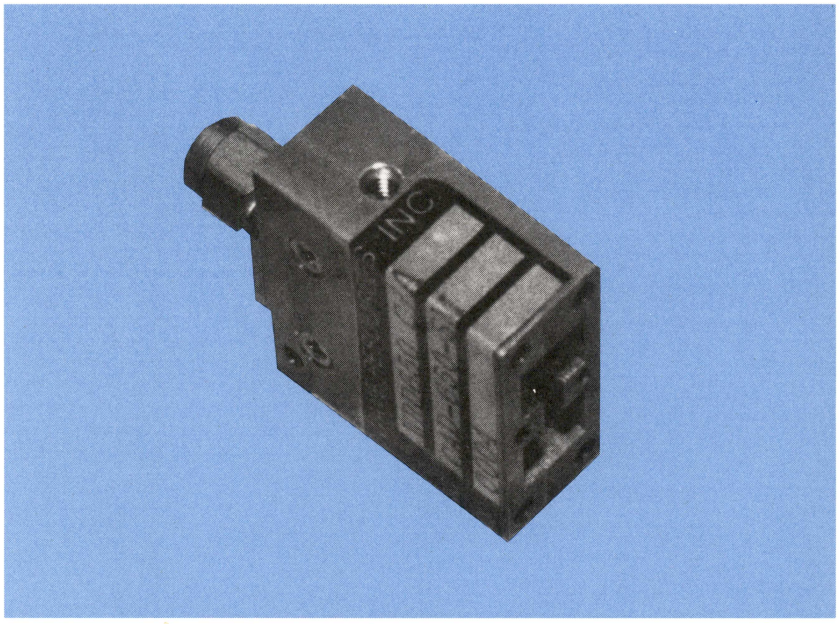
- MIL-F-39000 Flange
- MIL-C-39012 Connector
- MIL-W-23351 Waveguide
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Groove Flange
- 002: Shorter Length
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Better VSWR

SPECIAL FLANGE PATTERN?

Let us know when special flange patterns are used so we can modify ours to interface with yours. We provide full service to our Customers.



Model CAExxx: End-Launched Coax to WRD Adapter

MRI's product family of End-Launched Coax to Double Ridge Waveguide Adapters use a transition whose center conductor is structurally tied to the waveguide's housing, for excellent mechanical and thermal stability during vibration and while operating at high RF power levels. These low loss adapters are available with a variety of RF connectors.

MODEL NUMBER INFORMATION

Model Number	Double Ridge Waveguide	Frequency in GHz	Length (Inch)
CARE200	WRD200D24	2.00 - 4.80	6.00
CARE475	WRD475D24	4.75 - 11.0	4.00
CARE750	WRD750D24	7.50 - 18.0	2.50
CARE650	WRD650D28	6.50 - 18.0	2.00

ORDERING INFORMATION

Coaxial Connector:
Type (M: male, F: female)
Style (S: SMA, N: Type N, T: TNC, A7: APC-7)

Order Model Number: CARE650-SF

Model Number (see table)

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Pressure Inlet

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- Low Insertion Loss
- 2.4:1 Bandwidths
- 2.8:1 Bandwidths
- Rugged Construction

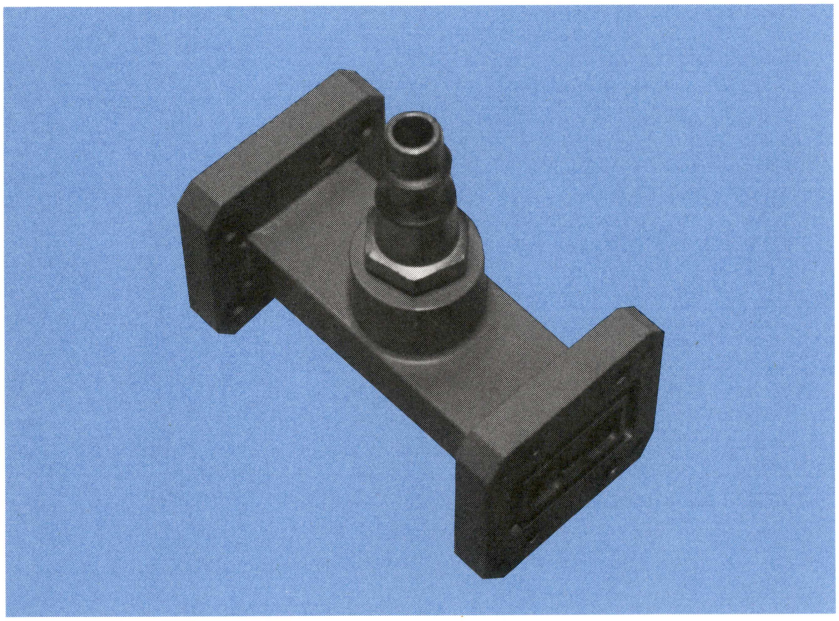
CONSTRUCTION:

- 1/8 Inch Pipe Fitting
- MIL-F-39000 Flanges
- MIL-W-23351 Waveguide
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Groove Flanges
- 002: Single Ridge W/G
- 003: (Spare)
- 004: Finish Selected

NEED SOMETHING DIFFERENT?
You'll find support at MRI for your custom application by phone: **404-441-9193,** or by FAXing your specs to us at: **404-449-8236**...today.



Model WDPxxx: Pressure Inlet

MRI's Pressure Inlets provide a means to apply dry air or sulphur hexaflouride into systems constructed in Double Ridge Waveguide, for controlling moisture or for increasing the peak RF power handling of the waveguide. These standard units are supplied with a 1/8" pipe fitting located in the broadwall of the Double Ridge section.

MODEL NUMBER INFORMATION

Model Number	Double Ridge Waveguide	Frequency in GHz	Length (Inch)
WDP200	WRD200D24	2.00 - 4.80	3.00
WDP350	WRD350D24	3.50 - 8.20	3.00
WDP475	WRD475D24	4.75 - 11.0	3.00
WPD750	WRD750D24	7.50 - 18.0	3.00
WPD110	WRD110D24	11.0 - 26.5	3.00
WPD180	WRD180D24	18.0 - 40.0	3.00
WPD650	WRD650D28	6.50 - 18.0	3.00

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Precision Terminations

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- 2.4:1 Bandwidth
- 2.8:1 Bandwidth
- Rugged Construction

SPECIFICATIONS:

- VSWR: 1.10
- Power: See Table
- Cover Flange

CONSTRUCTION:

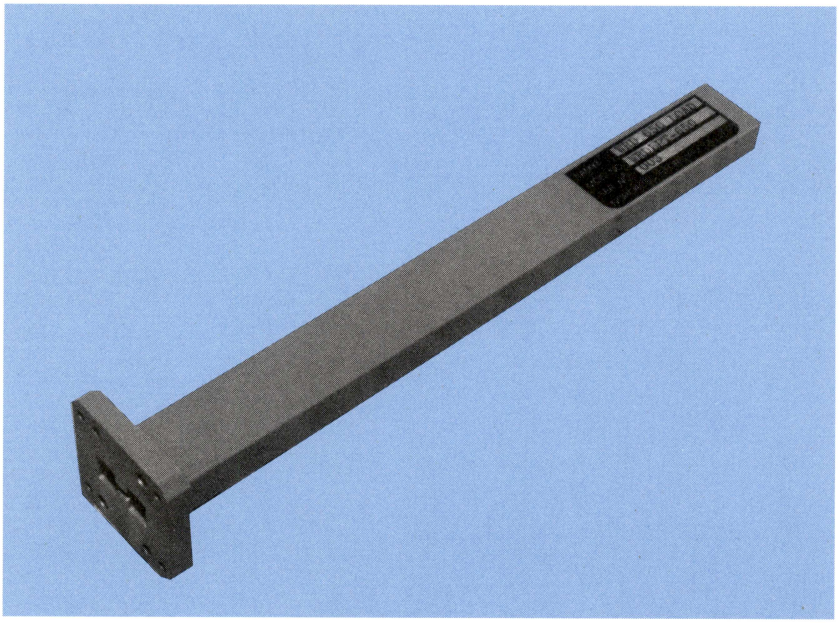
- MIL-F-39000 Flanges
- MIL-W-23351 Waveguide
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Groove Flange
- 002: Shorter Length
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Better VSWR

SPECIAL FLANGE PATTERN?

Let us know when special flange patterns are used so we can modify ours to interface with yours. We provide full service to our Customers.



Model WRDLPT Low Power Terminations

MRI's precision Double Ridge Waveguide Terminations offer excellent impedance match to broadband, low RF power systems operating across the full-band frequency range. The units use a precision ground load element firmly bonded to the extruded waveguide housing.

MODEL NUMBER INFORMATION

Model Number	Frequency in GHz	Double Ridge Waveguide	Power (Max.)	Length (Inch)
WRDLPT-200	2.00 - 4.80	WRD-200D24	25 W	17.0
WRDLPT-350A	3.50 - 8.20	WRD-350D24	20 W	15.0
WRDLPT-350B	3.50 - 12.4	WRD-350D36	20 W	15.0
WRDLPT-475	4.75 - 11.0	WRD-475D24	15 W	14.0
WRDLPT-500	5.00 - 18.0	WRD-500D36	15 W	13.0
WRDLPT-650	6.50 - 18.0	WRD-650D28	15 W	12.0
WRDLPT-750	7.50 - 18.0	WRD-750D24	15 W	12.0

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

High Power Terminations

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- Full-Band Coverage
- High Power Handling
- RFI Sealed Units
- Rugged Construction

SPECIFICATIONS:

- VSWR: 1.10
- RF Power: See Table
- Cover Flanges

CONSTRUCTION:

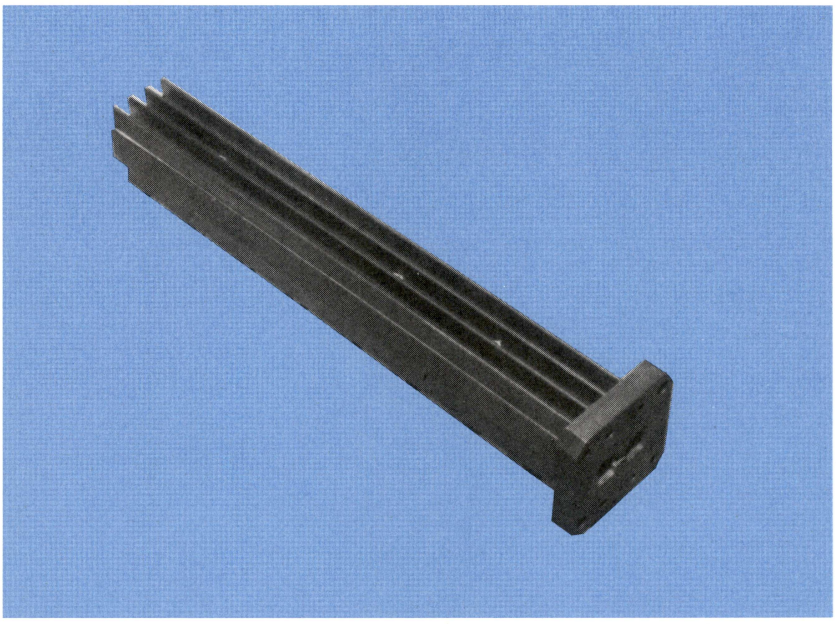
- MIL-F-39000 Flanges
- MIL-W-23351 Waveguide
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Groove Flange
- 002: Shorter Length
- 003: Pressurized Unit
- 004: Finish Selected
- 005: Better VSWR

PHONE OR FAX YOUR ORDER

Our Marketing staff will assist you when placing an order at **404-441-9193** to insure all parameters are complete for goods & services you need.



Model WRDHPT High Power Terminations

MRI's high RF power Terminations in Double Ridge Waveguide use precision ground silicon carbide load elements that are bonded to the internal wall for optimal heat transfer to the air cooled fins. These RFI-sealed units offer extended RF power capacity if thermally tied to a cold plate.

MODEL NUMBER INFORMATION

Model Number	Frequency in GHz	Double Ridge Waveguide	Power (Max.)	Length (Inch)
WRDHPT-200	2.00 - 4.80	WRD-200D24	850 W	17.0
WRDHPT-350A	3.50 - 8.20	WRD-350D24	700 W	15.0
WRDHPT-350B	3.50 - 12.4	WRD-350D36	600 W	15.0
WRDHPT-475	4.75 - 11.0	WRD-475D24	600 W	14.0
WRDHPT-500	5.00 - 18.0	WRD-500D36	500 W	13.0
WRDHPT-650	6.50 - 18.0	WRD-650D28	500 W	12.0
WRDHPT-750	7.50 - 18.0	WRD-750D24	500 W	12.0

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Waveguide Accessories

(Double Ridge Waveguide)

PRODUCT FEATURES:

- Excellent VSWR
- Low Insertion Loss
- 2.4:1 Bandwidths
- 2.8:1 Bandwidths
- Rugged Construction

CONSTRUCTION:

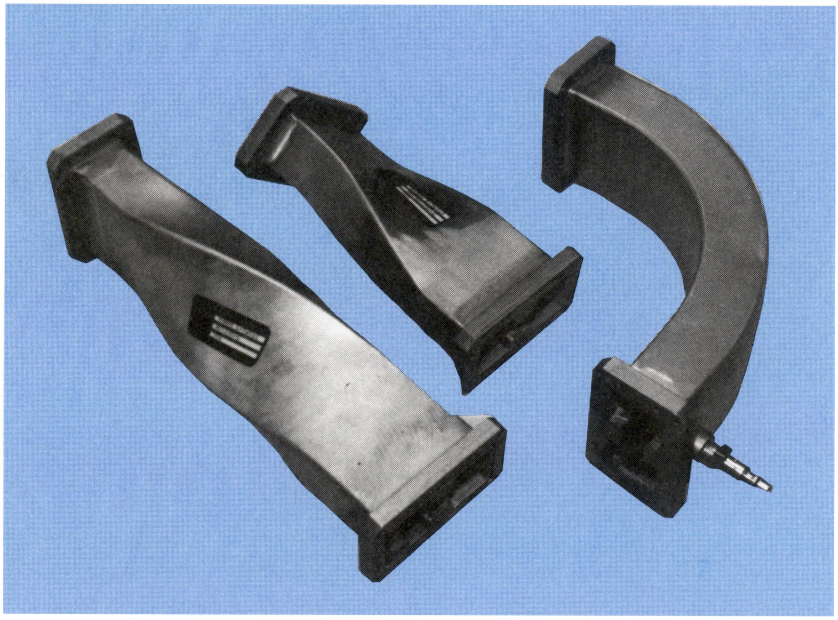
- MIL-F-39000 Flanges
- MIL-W-23351 Waveguide
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:

- 001: Groove Flanges
- 002: Single Ridge W/G
- 003: Pressurized Unit
- 004: Finish Selected

TECHNICAL ASSISTANCE?

Phone MRI's Engineering Staff at: **404-441-9193** to clarify any questions or FAX your specs to us at: **404-449-8236.**



Model WDSxxx: Straight Section
Model WDExxx: E-Plane Bend
Model WDHxxx: H-Plane Bend
Model WDTxxx: 90° Twist

Select from MRI's standard product line of Double Ridge Waveguide Accessories; from straight sections, bends and twists. Custom products and more complex WRD assemblies can be supplied by contacting our Atlanta area office.

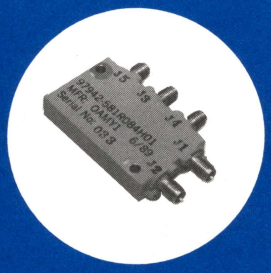
MODEL NUMBER INFORMATION

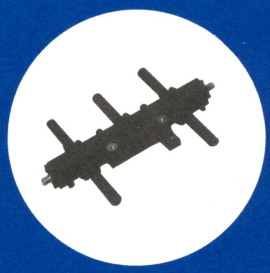
Double Ridge Waveguide	Frequency in GHz	Straight Section	E-Plane Bend	H-Plane Bend	W/G Twist
WRD200D24	2.00 - 4.80	WDS200	WDE200	WDH200	WDT200
WRD350D24	3.50 - 8.20	WDS350	WDE350	WDH350	WDT350
WRD475D24	4.75 - 11.0	WDS475	WDE475	WDH475	WDT475
WRD750D24	7.50 - 18.0	WDS750	WDE750	WDH750	WDT750
WRD110D24	11.0 - 26.5	WDS110	WDE110	WDH110	WDT110
WRD180D24	18.0 - 40.0	WDS180	WDE180	WDH180	WDT180
WRD650D28	6.50 - 18.0	WDS650	WDE650	WDH650	WDT650
When ordering, please specify:		Length and Flange	Bend Radius; Flange	Bend Radius; Flange	Length and Flange

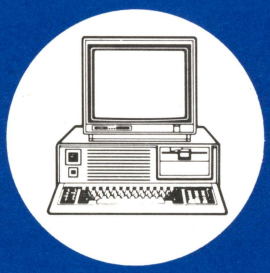
When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Custom Products







Networks & Subsystems

(Customer-Specific)

PRODUCT FEATURES:

- Antenna Feed Systems
- Monopulse Subsystems
- Beamforming Networks
- Polarization Networks
- Corporate Feed Networks
- Angle-of-Arrival Networks
- Divider/Combiner Networks

SPECIFICATIONS:

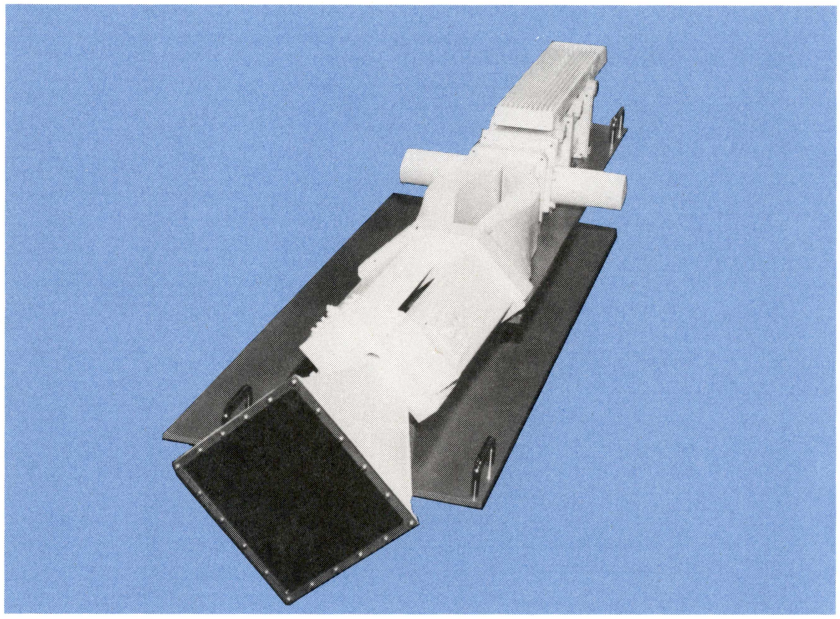
- Rugged Construction
- MIL-spec Temperatures
- High MTBF and Low MTTR
- Airborne or Ground-based
- Vibration/Shock Environments
- Prototype or Production

CONSTRUCTION:

- CAE/CAD Design Process
- CNC Fabrication Centers
- MIL-STD-454 Assembly
- MIL-I-45208 Quality System
- Qual Verification Tests
- MIL-STD-130 Identification

TECHNICAL ASSISTANCE?

Phone MRI's Engineering Staff at: **404-441-9193** to clarify any questions or FAX your specs to us at: **404-449-8236.**



Model Numbers: Contact Microwave Resources, Inc.

MRI develops Customer-specific Networks and Subsystems operating at RF/microwave frequencies for use in Radars, ECM/EW systems, and communication links. These Networks often apply our standard products for use in the subassembly, combined with new technical advances developed by our Project Engineers. MRI supports our Customers with Data Packages, Technical Design Reviews, and similar SDRL items, when required by contract.

ORDERING INFORMATION

To order your Network or Subsystem, send your Source Control Document(s) and/or Statement of Work to our office so a firm fixed-price Cost Proposal and Technical Proposal can be submitted to cognizant Project personnel. For most cases, our response to your RFP will include these items:

Cost Proposal:

- Basis of Quotation
- Delivery Schedule
- Cost Quotation
- Cost Back-up
- Terms and Conditions
- Executive Summary

Technical Proposal:

- Performance Summary
- Requirements vs. Capability
- Our Proposed Design Approach
- Technical Basis of the Unit
- Related Background/Experience
- Executive Summary

When preparing our response, all key topics are explored to propose the best technical approach within the guidelines of cost budgets and delivery requirements. Upon contract award, a Program Manager is assigned to lead the development team and to serve as your focal point for all contractual matters.

Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Waveguide Diode Switches

(Customer-Specific)

PRODUCT FEATURES:

- Single or Multi-Throw Units
- Narrow or Broad Bandwidths
- Fast Switching in Waveguide
- Custom Mechanical Packages

SPECIFICATIONS:

- Low Insertion Loss
- Isolation to 80 dB
- Fast Switching Times
- High Switching Rates
- TTL Control Logic
- DC Voltage: Select

CONSTRUCTION:

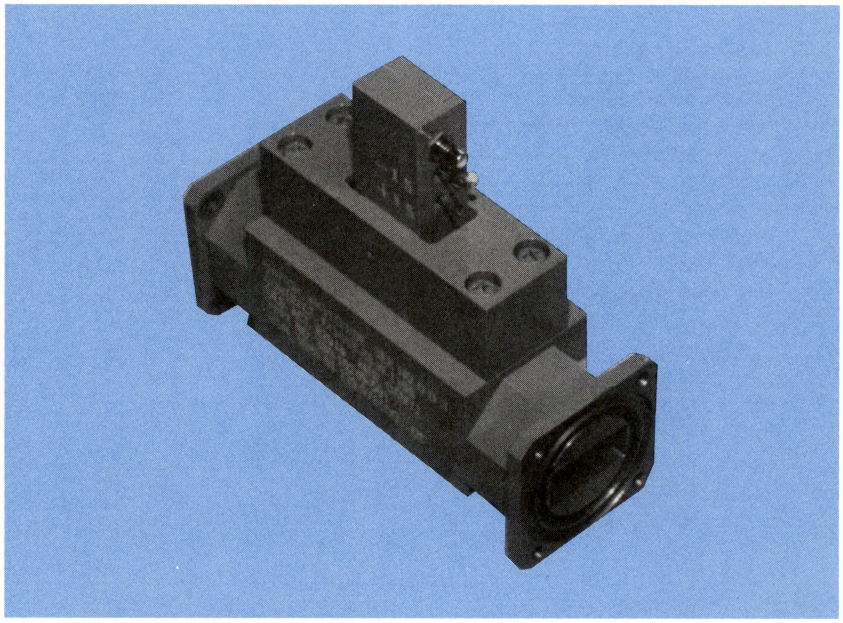
- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- MIL-C-5541/1A Iridite
- Solder/SMC Terminals
- Custom Mounting Feet
- Compact Physical Size

AVAILABLE OPTIONS:

- 001: DC Voltage: ±28 Volts
- 002: DC Voltage: ±15 Volts
- 003: Mixed RF Interfaces
- 004: Light-Weight Housing

SPECIAL FLANGE PATTERN?

Let us know when special flange patterns are used so we can modify ours to interface with yours. We provide full service to our Customers.



Model Numbers: Contact Microwave Resources, Inc.

MRI develops Customer-specific Switches and Switch Matrixes in all popular waveguide sizes. These units provide fast switching times and high isolation, which are typical for solid-state diode designs, across the full waveguide bandwidth. These single or multi-throw Switches are compact and are readily adapted to meet the form, fit and function of specific applications.

ORDERING INFORMATION

To order your Waveguide Switch or Switch Matrix, please contact our office and provide the following information on your unit:

- Block Diagram
- Passband Loss
- Isolation Specs
- Switching Time/Rate
- DC Supply Voltages
- Type of RF Ports
- Mounting Locations
- Physical Size Needed
- Environmental Specs
- Other Custom Specs

If you need assistance in defining your Switch or Switch Matrix, our Engineers can help clarify most specifications and can often provide design trade-offs on key performance parameters. Contact us by phone or FAX (404-449-8236) for support to your Waveguide Switch/Switch Matrix requirements.

Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Coaxial Coupler Modules

(Customer-Specific)

PRODUCT FEATURES:

- Narrow to Octave+ Bandwidths
- Strong or Loose Coupling
- Low Passband Ripple

SPECIFICATIONS:

- High Directivity
- Low Insertion Loss
- Excellent VSWR Match
- Coupling Value: Specify
- Flat Coupling Response

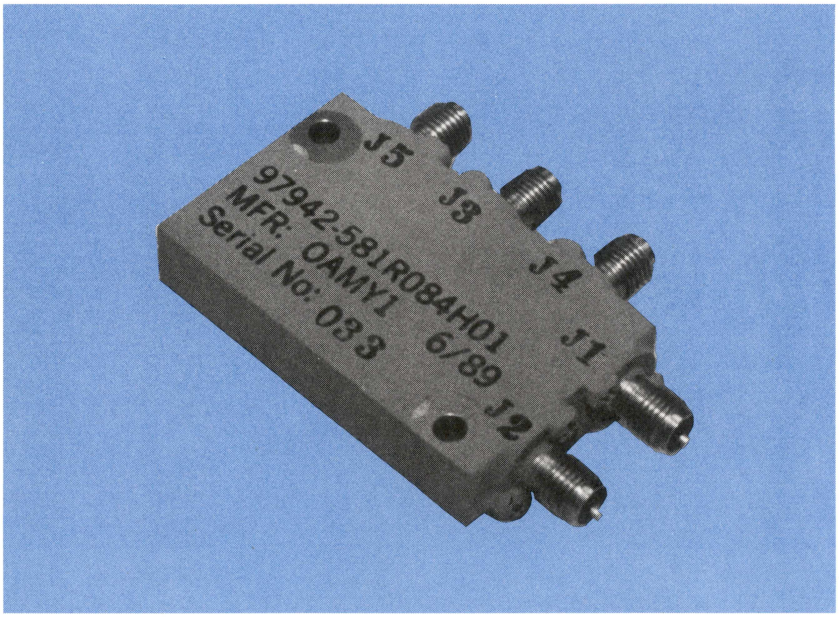
CONSTRUCTION:

- Balanced Stripline
- Edge or Broadside Coupling
- Air or Dielectric Supported
- RF Connectors: Specify
- Custom Mounting Feet
- Compact Physical Size

AVAILABLE OPTIONS:

- 001: Amplitude Tracking
- 002: Phase Tracking
- 003: Mixed RF Interfaces
- 004: Light-weight Housing
- 005: Tapered Coupling Profile

NEED SOMETHING DIFFERENT?
You'll find support at MRI for your custom application by phone: **404-441-9193,** or by FAXing your specs to us at: **404-449-8236**...today.



Model Numbers: Contact Microwave Resources, Inc.

MRI develops Customer-specific Coaxial Couplers and Coaxial Coupler Modules, including Corporate Feed Networks and Angle-of-Arrival Networks, that operate across narrow bandwidths or octave bandwidths. The design of individual couplers, or an integrated subassembly, are developed from our proprietary CAE software tools and the manufacturing experience of our Technical Staff. These units are developed to comply with the form, fit and function of Customer-specific applications.

ORDERING INFORMATION

To order your Coupler or Coupler Module, please contact our office and provide the following information on your unit:

- Block Diagram
- Coupling Values
- Passband Ripple
- Directivity Specs
- In/Out VSWR Specs
- Type of RF Ports
- Mounting Locations
- Physical Size Needed
- Environmental Specs
- Other Custom Specs

If you need assistance in defining your Coupler or Coupler Module, our Engineers can help clarify most specifications and can often provide design trade-offs on key performance parameters. Contact us by phone or FAX (404-449-8236) for support to your microwave Coupler/Coupler Module requirements.

Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

Microwave Filters

(Customer-Specific)

PRODUCT FEATURES:

- Multi-Section Designs
- Narrow Passbands, or
- Broad Passbands
- Rugged Construction

SPECIFICATIONS:

- Excellent Passband VSWR
- Low Insertion Loss
- Strong Skirt Rejections
- Good Group Delay

CONSTRUCTION:

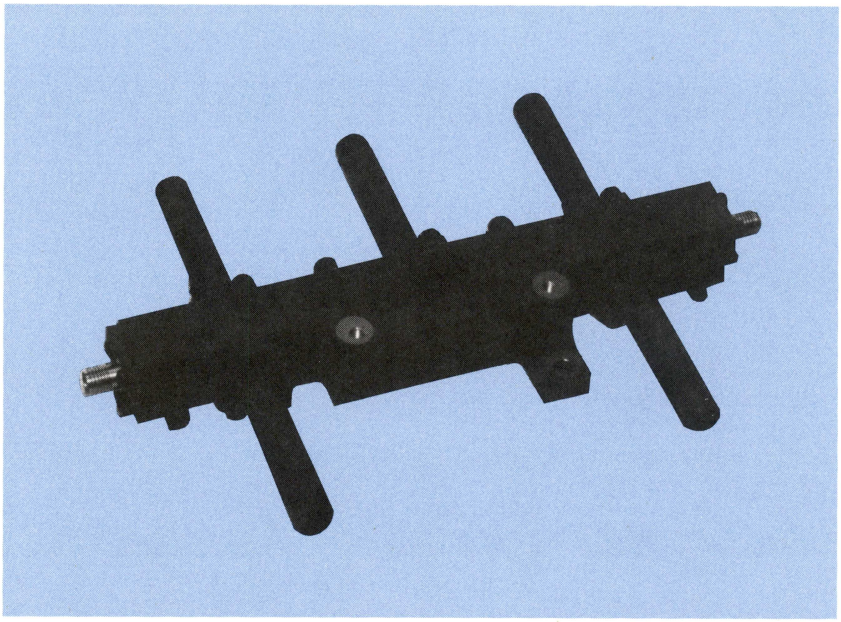
- Coax or Waveguide
- Gold/Silver Plating
- Custom Mounting Feet
- RFI/EMI Sealed Housing
- Compact Physical Sizes

AVAILABLE OPTIONS:

- 001: Amplitude Tracking
- 002: Phase Tracking
- 003: Mixed Interfaces
- 004: Light-weight Housing

PHONE OR FAX YOUR ORDER

Our Marketing staff will assist you when placing an order at **404-441-9193** to insure all parameters are complete for goods & services you need.



Model CLF/WLF: Lowpass Filter
Model CHF/WHF: Highpass Filter
Model CBPF/WBPF: Bandpass Filter
Model CBSF/WBSF: Bandstop Filter

MRI develops Customer-specific microwave filters in rectangular waveguide and in coaxial form using proprietary CAE design software that produces both physical dimensions and their analytical response profile versus frequency. Our custom filters can be designed to have a Lowpass, Highpass, Bandstop, or Bandpass response with equi-ripple or maximally-flat passband characteristics.

ORDERING INFORMATION

To order any Model Number, please contact our office and provide the following information on your filter:

- Type of Response
- Passband Frequency
- Insertion Loss Spec
- Passband VSWR Spec
- Skirt Rejection
- Type of RF Ports
- Mounting Locations
- Physical Size Needed
- Environmental Specs
- Other Custom Specs

If you need assistance in defining your filter, our Engineers can help clarify most specifications and can often provide design trade-offs on key filter parameters. Contact us by phone or FAX (404-449-8236) for support to your microwave filter requirements.

Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

MSAlines

(CAE Design Software)

PRODUCT FEATURES:

- User-friendly Interface
- Input Data Default Files
- Tabular Output Data
- Output Stored on Disk
- Coprocessor Support

SPECIFICATIONS:

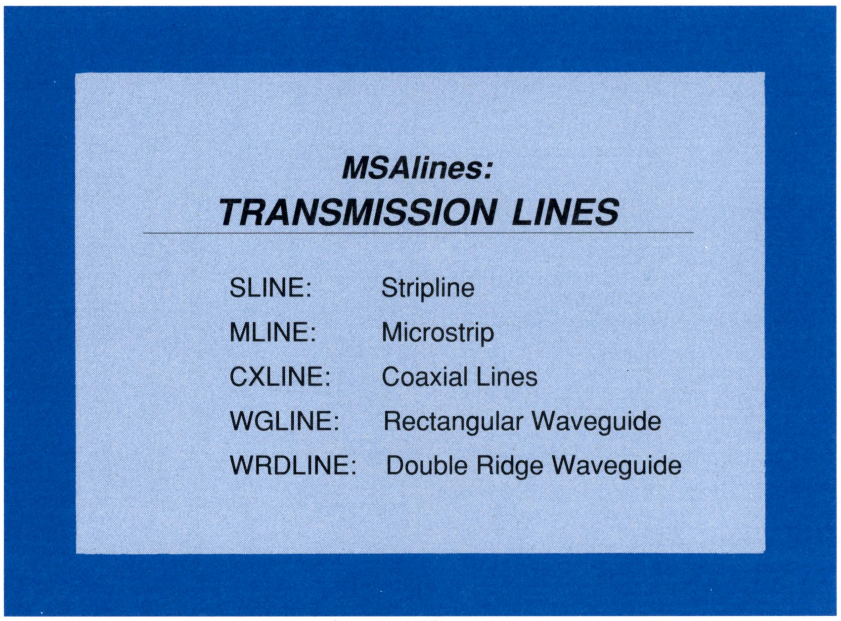
- Dimensional Synthesis
- Dimensional Analysis
- Frequency Analysis
- Sensitivity Analysis
- Higher Order Modes

DELIVERABLES:

- User Manual, 60+ Pages
- 2 Floppy Diskettes
- Software License
- Customer Support: 1 Year

HARDWARE REQUIREMENTS:

- PC/MS-DOS 2.0 or Higher
- IBM-PC or Compatible
- 150 K Bytes of Memory
- 5.25" Floppy Drive
- Math Coprocessor (Optional)



MSAlines from Microwave Software Applications, Inc

MSAlines is a product family of CAE design software that performs dimensional synthesis, frequency analysis and sensitivity analysis on all popular transmission lines used in RF/microwave circuits: Stripline, Microstrip, Coax, Rectangular & Double Ridge Waveguide. These CAE products are excellent training tools for new Engineers and increase the productivity of seasoned Engineers.

ORDERING INFORMATION

Model Number	Program Name	Program Description	Unit Price	RAM Memory
TRL001-100-0	SLINE	Stripline	$175.00	70 K
TRL002-100-0	MLINE	Microstrip	$175.00	75 K
TRL003-100-0	WGLINE	Waveguide	$235.00	85 K
TRL004-100-0	WRDLINE	Double Ridge	$395.00	110 K
TRL005-100-0	CXLINE	Coaxial	$235.00	70 K

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
P.O. Box 1109
Norcross, GA 30091
(404) 441-9193
FAX: (404) 449-8236

MSAcouplers

(CAE Design Software)

PRODUCT FEATURES:

- User-friendly interface
- Input Data Default Files
- Tabular Output Data
- Output Stored on Disk
- Coprocessor Support

SPECIFICATIONS:

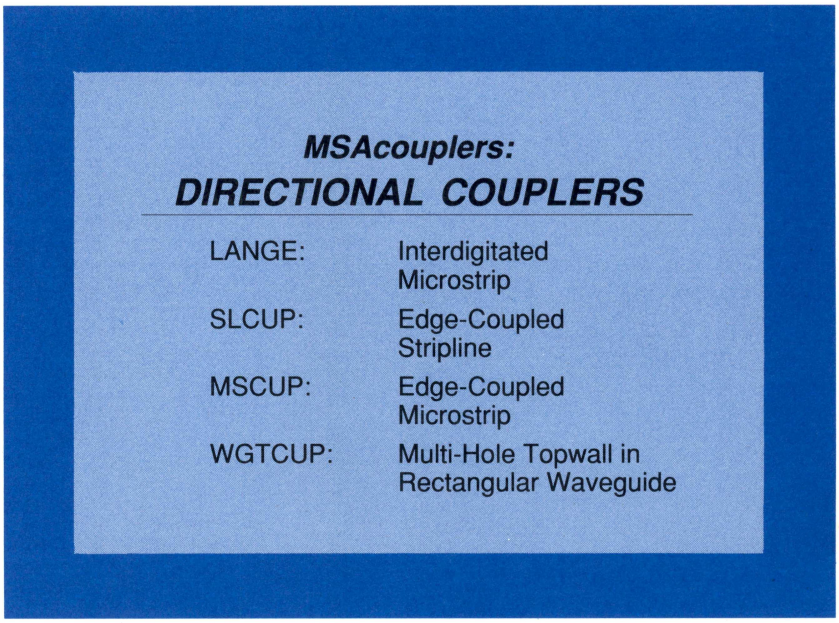
- Dimensional Synthesis
- Dimensional Analysis
- Frequency Analysis
- Sensitivity Analysis
- 4-port Response Profile

DELIVERABLES:

- User Manual, 60+ Pages
- 2 Floppy Diskettes
- Software License
- Customer Support: 1 year

HARDWARE REQUIREMENTS:

- PC/MS-DOS 2.0 or higher
- IBM-PC or Compatible
- 150 K Bytes of Memory
- 5.25" Floppy Drive
- Math Coprocessor (optional)



MSAcouplers from Microwave Software Applications, Inc.

MSAcouplers is a product family of CAE design software that performs dimensional synthesis, impedance analysis, frequency analysis and sensitivity analysis of Directional Couplers in stripline, microstrip, and rectangular waveguide. These CAE products use current circuit models for each design tool to determine key performance parameters, such as: Coupling, Directivity, VSWR, and Insertion Loss from the synthesized coupler or from the fabricated coupler. Excellent agreement is found between CAE output data and actual measured data on the coupler.

ORDERING INFORMATION

Model Number	Program Name	Program Description	Unit Price	RAM Memory
CUP001-200-0	LANGE	Microstrip	$1,200.00	150 K
CUP002-200-0	SLCUP	Stripline	$ 495.00	100 K
CUP003-200-0	MSCUP	Microstrip	$ 495.00	100 K
CUP004-200-0	WGTCUP	Waveguide	$2,200.00	150 K

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
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Norcross, GA 30091
(404) 441-9193
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MSAfilters

(CAE Design Software)

PRODUCT FEATURES:

- User-friendly Interface
- Input Data Default Files
- Tabular Output Data
- Output Stored on Disk
- Coprocessor Support

SPECIFICATIONS:

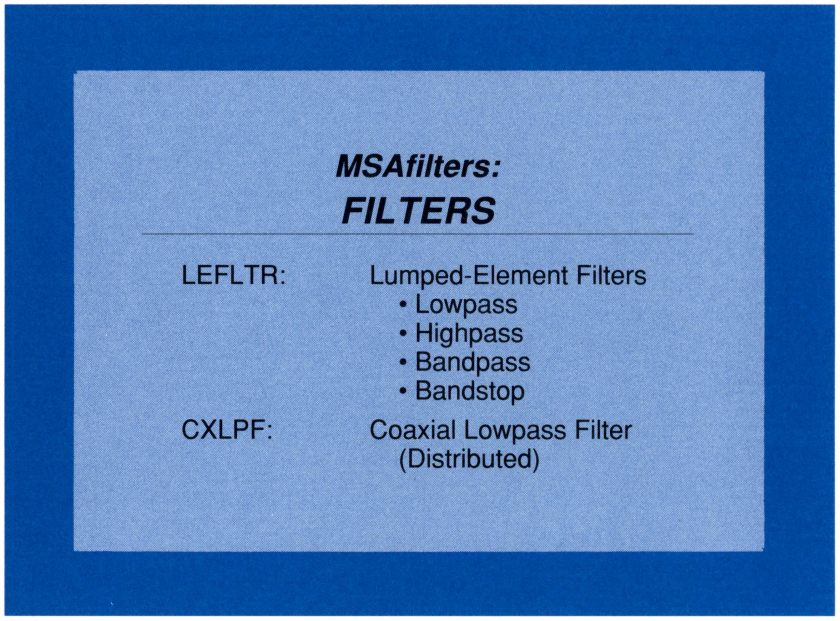
- Electrical Synthesis
- Dimensional Synthesis
- Frequency Analysis
- Standard/Dual Circuits
- Chebyschev/Butterworth

DELIVERABLES:

- User Manual, 60+ Pages
- 2 Floppy Diskettes
- Software License
- Customer Support: 1 Year

HARDWARE REQUIREMENTS:

- PC/MS-DOS 2.0 or Higher
- IBM-PC or Compatible
- 150 K Bytes of Memory
- 5.25" Floppy Drive
- Math Coprocessor (optional)



MSAfilters from Microwave Software Applications, Inc.

MSAfilters is a product family of CAE design software that performs electrical circuit synthesis and frequency analysis of lumped element and/or distributed Filters. These CAE design tools generate circuit parameters that exhibit an equiripple or maximally flat passband profile for multi-section filters, then analyzes the lumped or distributed circuit using a scattering parameter format. Loss effects from I*I*R and dielectrics are included in their circuit models.

ORDERING INFORMATION

Model Number	Program Name	Program Description	Unit Price	RAM Memory
FIL001-300-0	LEFLTR	Lumped Element * Lowpass * Highpass * Bandpass * Bandstop	$495.00	150 K
FIL002-300-0	CXLPF	Coaxial Lowpass (Distributed)	$495.00	100 K

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources, Inc.
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Norcross, GA 30091
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MICROWAVE RESOURCES, INC.
P. O. BOX 1109
NORCROSS, GA 30091

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